



Golden Valley Ranch Water and Sewer Master Plan

Prepared by



Stanley Consultants INC.

A Stanley Group Company
Engineering, Environmental and Construction Services - Worldwide

March 2006



ST-RH038238

Golden Valley Ranch

Water and Sewer Master Plan

Prepared for:

Rhodes Homes Arizona, L.L.C.
2215 Hualapai Mtn. Rd.
Suite H
Kingman, AZ 86401

Prepared by:

Stanley Consultants, Inc
5820 S. Eastern Ave. Suite 200
Las Vegas, NV 89119

Version 1.1

March 2006

ST-RH038239

**Golden Valley Ranch
Water and Sewer Master Plan**

Table of Contents

1.0 General.....	1.1
1.1 Introduction.....	1.1
1.1.1 Background.....	1.1
1.1.2 Objective.....	1.2
1.1.3 Authorization.....	1.2
1.1.4 Scope.....	1.2
1.2 Resources & Planning Documents.....	1.3
1.2.1 Lotting Matrix.....	1.3
1.2.2 Land Use Plan.....	1.3
1.2.3 Golden Valley Ranch Engineering Report.....	1.3
1.2.4 ADEQ Engineering Bulletin No. 10.....	1.3
2.0 Potable Water.....	2.1
2.1 Water Supply.....	2.1
2.1.1 Groundwater.....	2.1
2.1.2 Surface Water Option.....	2.1
2.1.3 Water Supply Quality.....	2.2
2.2 Water Demand.....	2.3
2.2.1 Residential Water Demand.....	2.3
2.2.2 School Water Demand.....	2.3
2.2.3 Commercial Water Demand.....	2.4
2.2.4 Offsite Water Demands.....	2.4
2.2.5 Peaking Factors.....	2.4
2.2.6 Water Demands per Pressure Zone.....	2.5
2.2.7 Fire Flows.....	2.5
2.3 Potable Water System.....	2.6
2.3.1 General.....	2.6
2.3.2 Pressure Zones.....	2.6
2.3.3 Reservoirs.....	2.7
2.3.4 Wells.....	2.9
2.3.5 Transmission Pipelines.....	2.9
2.3.6 Distribution Pipelines.....	2.10
2.3.7 Water Quality.....	2.11
2.3.8 System Reliability and Redundancy.....	2.11
2.4 Future Water Facilities.....	2.12
2.4.1 Offsite Water Demand.....	2.12
2.4.2 Future Facilities.....	2.12
2.5 Water System Phasing.....	2.13
3.0 Sanitary Sewer.....	3.1
3.1 Wastewater Contributions.....	3.1
3.1.2 Offsite Contributions.....	3.2
3.2 Facility Layout.....	3.3

**Golden Valley Ranch
Water and Sewer Master Plan**

3.2.1 Service Area.....	3.3
3.2.2 Offsite Sewer Connections	3.3
3.2.3 Sewer Alignments.....	3.3
3.2.4 Sewer Crossings.....	3.3
3.2.5 Sewer Outfalls.....	3.3
3.2.6 Wastewater Treatment Plants	3.4
3.3 Sanitary Sewer Design Criteria.....	3.5
3.3.1 Operational Requirements	3.5
3.4 Sewer Collector Model	3.6
3.4.1 Model Development.....	3.6
3.4.2 Model Requirements.....	3.6
3.4.3 Model Output.....	3.6
3.4.4 Proposed Collection Plan.....	3.6

Appendices

Appendix A – Reference Documents
Appendix B – Water Demand and Facility Sizing Calculations
Appendix C – Water Model Output
Appendix D – Sewer Contribution Calculations
Appendix E – Sewer Model Output
Appendix F – System Phasing

List of Tables

Table 2.1 Golden Valley Ranch Residential Demand Summary.....	2.3
Table 2.2 Offsite Maximum Day Demands per Zone.....	2.4
Table 2.3 Golden Valley Ranch Water Demands per Zone.....	2.5
Table 2.4 Static Pressure Range within Golden Valley 2850 Zone.....	2.6
Table 2.5 Static Pressure Range within Golden Valley 2750 Zone.....	2.7
Table 2.6 Static Pressure Range within Golden Valley 2650 Zone.....	2.7
Table 2.7 Golden Valley Ranch Reservoir Volumes per Pressure Zone.....	2.8
Table 2.8 Golden Valley Ranch Required Wells.....	2.9
Table 2.9 Distribution System Operating Requirements	2.10
Table 2.10 Offsite Water Demands per Zone	2.12
Table 2.11 Required Wells for Offsite Demands	2.12
Table 2.12 Offsite Reservoir Volumes per Pressure Zone	2.13
Table 2.13 Golden Valley Ranch Water Demands per Phase	2.13
Table 3.1 Average Day Wastewater Contribution Factors	3.1
Table 3.2 GVR Wastewater Contribution Summary	3.1
Table 3.3 Offsite Wastewater Contributions	3.2
Table 3.4 Gravity Sewer Design Criteria.....	3.5
Table 3.5 Manhole Spacing Criteria.....	3.5

**Golden Valley Ranch
Water and Sewer Master Plan**

List of Figures

Figure 1.1 – Vicinity Map / Service Area
Figure 1.2 – Land Use Plan
Figure 2.1 – Potable Water System Schematic
Figure 2.2 – Water System Overview
Figure 2.3 – Onsite Water Distribution Pipelines
Figure 2.4 – Reservoir 2750 North Site Plan
Figure 3.1 – Wastewater Flow Direction
Figure 3.2 – Onsite Sewer Collection System
Figure C-1 – H2O Map Water Pipe and Node ID Map
Figure C-2 – H2O Map Water Pipe and Node ID Map
Figure E-1 – H2O Map Sewer Manhole and Pipe ID Map
Figure F-1A – Phase 1A Water Plan
Figure F-1B – Phase 1B Water Plan
Figure F-2 – Phase 2 Water Plan
Figure F-3 – Phase 3 Water Plan
Figure F-4 – Phase 4 Water Plan
Figure F-5 – Phase 5 Water Plan
Figure F-6 – Phase 6 Water Plan
Figure F-7 – Phase 7 Water Plan

**Golden Valley Ranch
Water and Sewer Master Plan**

1.0 General

1.1 *Introduction*

Golden Valley Ranch (GVR) is a proposed master planned community located in northern Arizona, southwest of the city of Kingman. This utility planning document proposes water and sewer infrastructure required to service the GVR development. In addition to onsite infrastructure planning, future offsite parcels have also been included in the planning. Utility infrastructure considered in this document includes wells, reservoirs, distribution and transmission pipelines, major sewer collection pipelines, and wastewater treatment plants. A vicinity map is provided on Figure 1.1 at the end of this section.

1.1.1 Background

The project area is currently undeveloped in respect to organized development. There are several former and existing manufactured homes on, or adjacent to the project boundary. Water service is provided by individual private wells or water trucks. Several miles to the north, the Valley Pioneers Water Company (VPWC) operates a 1,800 connection system which serves Mohave County. The VPWC's existing water system infrastructure in the area is inadequate to support a municipal type water supply system.

Water resources in the area have been determined sufficient to support municipal type development. Errol L. Montgomery & Associates (Montgomery) has performed hydro-geologic studies to demonstrate adequate water supply and have applied for a letter of water adequacy from the Arizona Department of Water Resources (ADWR). One letter of Adequate Water Supply was issued by the ADWR on October 19, 2005. The designation is for 9,000 acre-feet per year, which is less than the 15,911 acre-feet per year rate requested in the application. An additional application is being prepared to apply for the remaining demand which will come from the adjacent groundwater basin to the south of the site.

The water and sewer utilities required for this planned development are presented in the following two sections. The Golden Valley Ranch and offsite parcels are presented on Figure 1.2 at the end of this Section.

**Golden Valley Ranch
Water and Sewer Master Plan**

1.1.2 Objective

The primary objective of this master plan is to provide a utility planning document to be used by developers, Perkins Mountain Water Company, Engineering Consultants, the City of Kingman, and the Arizona Department of Environmental Quality as a guide in the pre-design, design, and construction efforts of the water and sewer infrastructure required to support the Golden Valley Ranch development. Offsite parcels around the development are being accounted in the planning efforts to minimize future disruptions to the community's roadways. Secondary objectives for the master planning of Golden Valley Ranch are presented below.

- ◆ Analyze existing infrastructure to determine the capacity to serve Golden Valley Ranch.
- ◆ Quantify water demands and sewer contributions for GVR.
- ◆ Determine well and reservoir sites.
- ◆ Establish alignments and infrastructure corridors for utilities serving the site.
- ◆ Model and size GVR water and sewer infrastructure.
- ◆ Model and size Golden Valley Ranch offsite infrastructure.
- ◆ Prepare a water phasing plan for the development.

1.1.3 Authorization

Rhodes Homes Arizona retained Stanley Consultants, Inc on July 22, 2005 to conduct the water and sewer utility planning efforts for the Golden Valley Ranch Master Planned Community. Master planning for offsite utilities was not included; however, both the water and sewer system were sized to accommodate additional offsite parcels. Offsite parcels were determined as under ownership or control by Rhodes as of December 2005.

1.1.4 Scope

The scope of work for the Golden Valley Ranch Water and Sewer Master Plan includes the following tasks.

- ◆ Task 1 – Prepare a final Water and Sewer Master Plan for provision of a municipal water supply system to service the 5800 acre Golden Valley Ranch.
- ◆ Task 2 – Prepare a hydraulic model of the proposed system.
- ◆ Task 3 – Identify appropriate zone splits, tank site locations, and prospective future well sites.

**Golden Valley Ranch
Water and Sewer Master Plan**

- ◆ Task 4 – Prepare an overall capital facilities plan for source of supply, storage, booster pumps, major pipelines, and related major appurtenances.
- ◆ Task 5 – Identify point of outfall to wastewater treatment plant sites.

1.2 Resources & Planning Documents

1.2.1 Lotting Matrix

The *Golden Valley Ranch Specific Plan – Lotting Matrix*, revised December 2005, states the following:

- ◆ Total Dwelling Units (DU's) = 33,180 units
- ◆ Town Center DU's = 10,000 units
- ◆ Total Active Adult Residential Units = 12,230
- ◆ Total Conventional Residential Units = 8,175
- ◆ Total Apartment Units = 2,775
- ◆ Total Developable Acres = 4,050 acres
- ◆ Calculated Overall Density = 5.77 units/acre

1.2.2 Land Use Plan

The Land Use Plan, prepared in December 2005 by Stanley Consultants, is presented at the end of this section and in Appendix A. The Land Use Plan states the following:

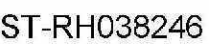
- ◆ Parcel Boundaries
- ◆ Parcel Acreages
- ◆ Parcel Land Use

1.2.3 Golden Valley Ranch Engineering Report

The Golden Valley Ranch Engineering Report, prepared in May 2005 by Stanley Consultants, Inc., has been utilized as a foundation for the development of water system presented in this masterplan.

1.2.4 ADEQ Engineering Bulletin No. 10

The Golden Valley Ranch has been designed in accordance to criteria and guidelines set forth by ADEQ's Engineering Bulletin No. 10 – Guidelines for the Construction of Water Systems.



ST-RH038246

Year	1990	2000	2010
500			
0			
1500			
3000			

(IN FEET)



LEGEND

- ## LEGEND

LEGEND

- ## LEGEND

LEGEND

LEGEND

LEGEND